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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,867	12/31/2001	Ralph Sigling	GR99P3438	4654
24131	7590	05/23/2005	EXAMINER	
LERNER AND GREENBERG, PA P O BOX 2480 HOLLYWOOD, FL 33022-2480			DUONG, THANH P	
			ART UNIT	PAPER NUMBER
			1764	
DATE MAILED: 05/23/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/035,867	Applicant(s) SIGLING, RALPH	
	Examiner Tom P. Duong	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-13 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's remarks and amendments filed on March 3, 2005 have been carefully considered. Claim 1 has been amended. Claims 1-13 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-2 and 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Publication Number 10151324 (JP '324). Regarding claims 1 and 8, JP '324 discloses a device for cleaning flue gas (Fig. 1), comprising: a flue gas passage (1) for conducting flue gas in a given flow direction; an apparatus (ammonia injection part 4) for injecting an additive adapted to release a reducing agent (ammonia) in said flue gas passage; a catalytic converter (catalyst bed 3) for reducing nitrogen oxides disposed in said flue gas passage; a mixer (8) for rendering a mixing of the flue gas with the reducing agent more uniform disposed upstream and downstream of said catalytic converter (first catalyst bed 3) (Section 001 and Figure 1) in the given flow direction and a rectifier (straightening vane 7) installed upstream of catalyst bed 3. With respect to the mixer installing a mixer downstream of the last catalytic converter, it would have

Art Unit: 1764

been a *prima facie* case obviousness in view of JP '324 to one having ordinary skill in the art to provide additional mixer(s) downstream the second catalytic layer (3) or downstream of last catalyst bed 3 since it has been held in the art that mere duplication of parts has no patentable significance unless a new and unexpected result is produced (See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)). In addition, enlight of specification on page 14, lines 14-20, it is not clear how a "mixer" (12) downstream of the last catalyst converter contributes to the deNoxing of the flue gas being the fact the "mixer" is located much further downstream of the last catalyst converter. Regarding claims 2 and 4, JP '324 discloses a first mixer (mixer 8 downstream of first catalyst bed 3) and a second mixer (mixer 8 located upstream of first catalyst bed 3) and a first flow rectifier (straightening vane 7) are disposed between the injection part 4 and first catalyst bed 3. Regarding claim 5, JP '324 discloses a catalytic converter is composed of a plurality of catalytic converter layers (3, 3) and a mixer (8) disposed downstream of the first catalytic converter layer (3). JP '324 does not show a second mixer after the second catalytic converter layer or a respective mixer disposed downstream of each catalytic-converter layer (3). However, it would have been a *prima facie* case obviousness in view of JP '324 to one having ordinary skill in the art to provide additional mixer(s) after the second catalytic layer (3) since it has been held in the art that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. (See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)). Regarding claim 6, JP '324 discloses a rectifier (7) for the flowing flue gas disposed in said catalytic converter upstream of at least one of said catalytic-converter

layers (3, 3). Regarding claim 7, JP '324 discloses a straightening vane 7 or grid rectifier. For purpose of argument, if straightening vane is not a grid type rectifier, then it would have been obvious to modify the rectifier of JP '324 with a conventional grid type rectifier to prevent stagnating and swirling of the flue gas.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Publication Number 10151324 (JP '324) in view of Herr et al. (6,086,241) and Kallinich et al. (4,919,170). Regarding claim 3, JP '324 fails a diverter apparatus for the flowing flue gas disposed between said second mixer and said first flow rectifier. Herr teaches the diverter apparatus (Fig. 3, guide vane 32) to facilitate directing the flow of the flue gas around the bend location (bend direction 28) in order to minimize pressure drop in the flue gas conduit (Fig. 3 and Col. 10-32). Likewise, Kallinich also teaches a flow guide elements 2 (Fig. 1) to facilitate the transfer of flue gas in the flow duct 1 around the bend area further downstream. Thus, it would have been obvious in view of Herr and/or Kallinich to one having ordinary skill in the art to modify the device of JP '324 with diverter apparatus as taught by Herr and/or Kallinich in order to facilitate directing the flow of the flue gas around the bend location.

3. Claims 9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '324 in view of Huber (3,785,620). Regarding claims 9 and 11-12, JP '324 discloses a mixer of the claimed invention but fails to disclose a specific type of mixer comprises of a plurality of immovable lamellae, disposed obliquely with respect to a flue

Art Unit: 1764

gas flow. Huber teaches a mixing apparatus comprises of a plurality of lamellas disposed at an angle relative to the direction of the media flow. The use of such mixing apparatus allows the gases (Col. 2, lines 1-2) to be uniformly mixed together in a relatively short length (Col. 1, lines 32-34). Thus, it would have been obvious in view of one having ordinary skill in the art to modify the apparatus of JP '324 with mixer of lamella type as taught by Huber '620 in order to allow the gases to be uniformly mixed together. With respect to the mixer having wider lamellae disposed upstream and downstream of a catalyst converter than mixers assigned to the catalytic converter, it would have been obvious in view of the applied references (JP '423 in view of Huber '620) to provide a wider lamellae for mixers upstream and downstream of the catalytic converter to minimize press drop increase across the flue gas conduit and narrow lamellae mixers in the catalyst bed to facilitate the conversion or reduction of NO_x in the flue gas stream. In addition, Applicant has not disclosed advantages and/or unexpected results for having a wider lamella mixer in the upstream and downstream versus narrow lamella mixer in the catalytic converter. Thus, it would have been obvious in view of the applied references to one having ordinary skill in the art that the mixers of the applied references provide the same performance as the mixers of the claimed invention.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '324 in view of MacInnis (5,437,851) and Kuroda et al. (5,078,973). JP '324 discloses the mixer downstream of the catalytic converter but fails to disclose an air preheater connected downstream of converter and heated by the flue gas. MacInnis teaches an

air preheater is disposed downstream of a selective catalytic reduction (SCR) reactor as shown on Figure 1 to preheat the combustion air. Likewise, Kuroda teaches an air preheater (air heater 18) is disposed downstream of the treated flue gas to recover the heat for the combustion air to the boiler (Col. 5, lines 34-39). Thus, it would have been obvious in view of MacInnis and Kuroda to one having ordinary skill in the art to modify the apparatus of JP '324 with either an air preheater as taught by MacInnis or an air heater as taught by Kuroda in order to recover the heat from the flue gas and preheat the combustion air for such as the boiler.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '324 in view of Dunn Jr. et al. (5,423,272). JP '324 fails to disclose the device is connected from a fossil-fuel fired steam generator in a power plant. Dunn teaches it is conventional to provide flue gas cleaning device (SCR) downstream of a fossil fuel-fired power generation system to remove the Nox from flue gas stream (Col. 2, lines 27-60). Thus, it would have been obvious in view of Dunn to one having ordinary skill in the art to incorporate the device of JP ' 324 in the fossil fuel-fired power generation system as taught by Dunn in order to purify the flue gas.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 5,043,146 discloses conventional grid type rectifier to prevent stagnating and swirling of the flue gas.

Response to Arguments

Applicant's arguments filed March 3, 2005 have been fully considered but they are not persuasive. With respect to the argument of a mixer disposed downstream of the last catalytic converter, JP '324 discloses mixers 8 upstream and downstream the catalyst bed and but not downstream of the last catalyst bed. However, it would have been a *prima facie* case obviousness in view of JP '324 to one having ordinary skill in the art to provide additional mixer(s) downstream the second catalytic layer (3) or downstream of last catalyst bed 3 since it has been held in the art that mere duplication of parts has no patentable significance unless a new and unexpected result is produced (See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). In addition, enlight of specification on page 14, lines 14-20, it is not clear how a "mixer" (12) downstream of the last catalyst converter contributes to the deNoxing of the flue gas being the fact the "mixer" is located much further downstream of the last catalyst converter.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within


TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong
May 9, 2005
TD *TD*


Glenn Caldarola
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